CITY OF JEROME (PWS 5270011)
SOURCE WATER ASSESSMENT FINAL REPORT

April 29, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the City of Jerome, Jerome, Idaho,* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The City of Jerome drinking water system (PWS 5270011) consists of five ground water wells. There is insufficient locational data for the Marshall Well. Therefore, information concerning the Marshall Well is not included in this report. The 10^{th} Street Wells #1 and #2, the A Street Well, and the Peter's Street Well all have a moderate susceptibility to all potential contaminant categories: inorganic contaminants (IOCs), volatile organic contaminants (VOCs), synthetic organic contaminants (SOCs), and microbial contaminants. The multiple potential contaminant sites in the 3-year TOT zones within the delineations of the wells as well as the moderate system construction and hydrologic sensitivity scores contributed to the overall susceptibility of the wells of the City of Jerome.

The VOCs Trihalomethanes, disinfection by-products created by reactions of the disinfectant with natural organic matter present in the water, were detected in all of the wells between July 1998 and February 2000. Arsenic was detected in 1979 at 19 micrograms per liter (μg/L) and in 1997 at 5 μg/L. Though the arsenic detected in 1997 shows a decrease, it is still one-half of the newly revised maximum contaminant level (MCL) of 10 μg/L. In a 2000 analysis report no arsenic was detected. In October 2001, the EPA reduced the arsenic MCL from 50 μg/L to 10 μg/L, giving public water systems until 2006 to comply with the new standard. Other IOCs including antimony, barium, chromium, fluoride, nitrate, iron, lead, magnesium, manganese, selenium, zinc, and nickel were detected in water samples collected from the water system at concentrations far below the MCLs. No SOCs have been detected in the wells. However, the county has been rated as high for nitrogen pesticide use, herbicide use, and total agricultural chemical use. Total coliform bacteria were detected in the distribution system in August 1994, August 1996, October 2000, and November 2001.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Jerome, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spills from the potential contaminant sources listed in Tables 1, 2, and 3 (Attachment A) of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Engineering controls may need to be implemented if the arsenic levels in the drinking water system rise. Also, disinfection practices should be maintained if microbial contamination becomes a problem. The production of Trihalomethanes (disinfection by-products) can be reduced by treatment modifications. For control strategies and disinfection by-product information, see www.epa.gov/safewater/mdbp/dbpl.html. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the City of Jerome, making partnerships with state and local agencies and industry groups critical to success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are major transportation corridors through the delineations; therefore the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE CITY OF JEROME, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment areas and the inventory of significant potential sources of contamination identified within those areas are attached. The lists of significant potential contaminant source categories and their rankings, used to develop this assessment, are also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Jerome drinking water system includes five community wells that serve a population of 7,300 through 3,100 connections. The Marshall Well is not included in this report. The 10th Street Wells (#1 and #2) are located next to each other along 10th Avenue between Lincoln Avenue and Fillmore Street. The Peter's Street Well is located along Highway 25 approximately 1.5 miles east of town. The A Street Well is located along east A Avenue in the east central part of town (Figure 1).

The water from the 10th Street Wells is pumped to a 300,000-gallon reservoir located along 10th Avenue. A second reservoir with a one million-gallon capacity is located adjacent to the Peter's Street Well and receives water from this well. The A Street Well pumps water to a one million-gallon reservoir located along A Avenue. These reservoirs maintain system pressure at 85-90 pounds per square inch (psi) on the west side of town and 70-75 psi on the east side of town. Gas chlorinating systems are used at the Peter's Street Well and the 10th Street Wells and a chlorine generation system is used at the A Street Well.

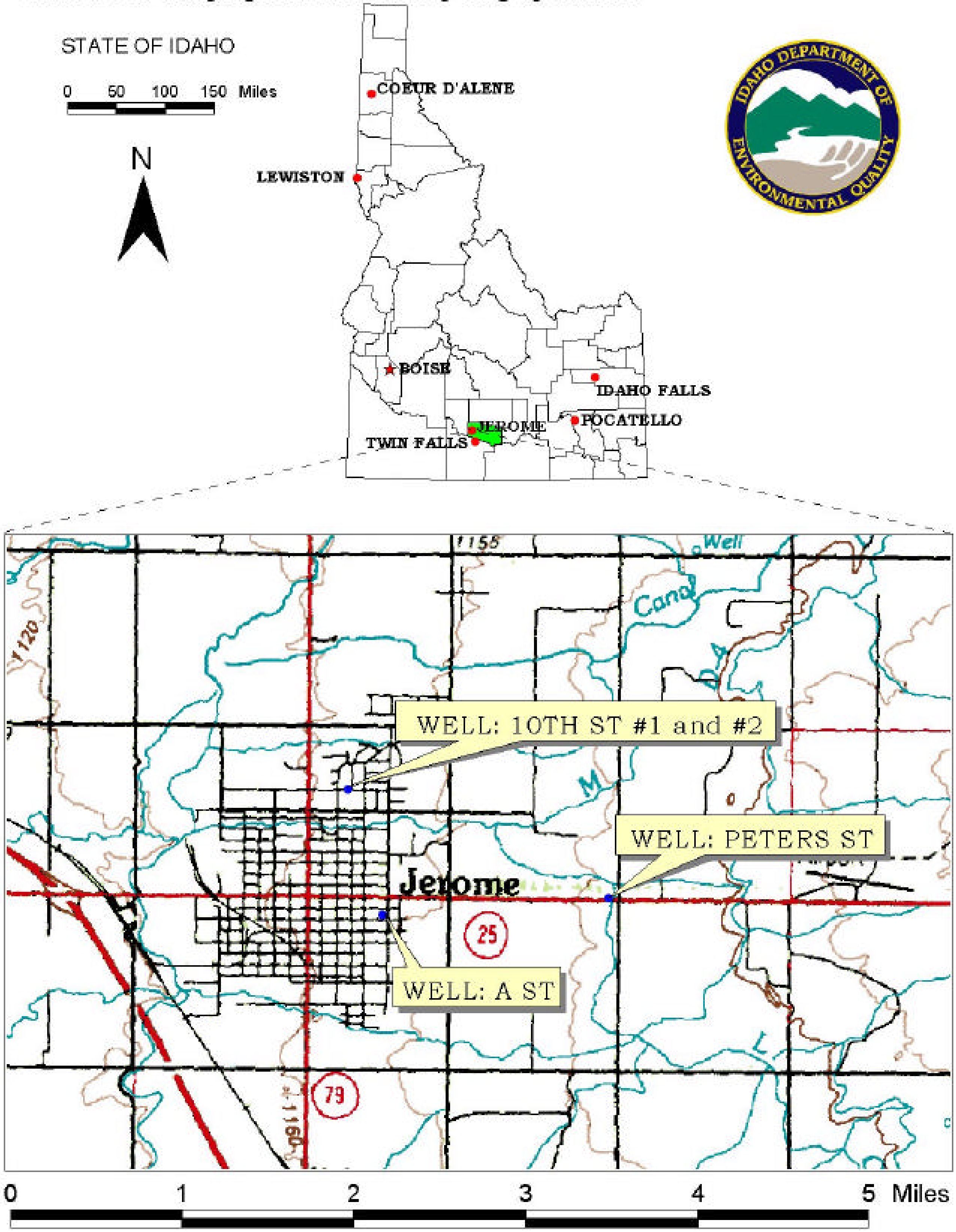
Trihalomethanes, disinfection by-products created by reactions of the disinfectant with natural organic matter in the water, were detected in all of the wells between July 1998 and February 2000. Arsenic was detected in 1979 at 19 µg/L and in 1997 at 5 µg/L. Though the arsenic detected in 1997 shows a decrease, it is still one-half of the newly revised MCL of 10 µg/L. In October 2001, the EPA reduced the arsenic MCL from 50 µg/L to 10 µg/L, giving public water systems until 2006 to comply with the new standard. Other IOCs including antimony, barium, chromium, fluoride, nitrate, iron, lead, magnesium, manganese, selenium, zinc, and nickel were detected in water samples collected from the water system at concentrations far below the MCLs. No SOCs have been detected in the wells. However, the county has been rated as high for nitrogen pesticide use, herbicide use, and total agricultural chemical use. Total coliform bacteria were detected in the distribution system in August 1994, August 1996, October 2000, and November 2001.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. Washington Group, International (WGI) used a refined computer model approved by the EPA in determining the time-of-travel (TOT) zones for water associated with the Southwest Eastern Snake River Plain (SW ESRP) aquifer. The computer model used site-specific data, assimilated by DEQ and WGI from a variety of sources including local area well logs and hydrogeologic reports summarized below.

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are filled primarily with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with sedimentary rocks along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

FIGURE 1. Geographic Location of City of Jerome



The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p. 15).

Regional ground-water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Southwest Margin of the ESRP hydrologic province is the regional aquifer's primary discharge area. Interpretation of well logs indicates that a 1- to 23-foot-thick layer of sediment overlies the fractured basalt aquifer in Jerome County, and that an 8- to 410-foot-thick layer of sediment overlies the same aquifer in southern Minidoka and Power Counties. Published geologic maps of the Snake River Plain (Whitehead 1992, Plates 1 and 5) indicate there is 100 to 500 feet of Quaternary to Tertiary Basalts aged compacted to poorly consolidated sediments located in the Heyburn area (north of the Snake River near Burley). The saturated thickness of the regional basalt aquifer for the Southwest Margin is estimated to range from less than 500 feet near the Snake River to 1,500 feet near Minidoka.

A published water table map of the Kimberly to Bliss region of the aquifer (Moreland, 1976, p. 5) indicates that the ground-water flow direction in the Southwest Margin is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Annual average precipitation for the period 1951 to 1980 is 9.6 inches in both Twin Falls and Burley (Kjelstrom, 1995, p. 3). The estimated recharge from precipitation in the Southwest Margin ranges from less than 0.5 inch to more than 2 in./yr (Garabedian, 1992, p. 20). Kjelstrom (1995, p. 13) reports an annual river loss of 110,000 acre-feet to the aquifer for the 34.8-mile Minidoka-to-Milner reach of the Snake River. River gains of 210,000 acre-feet for the 21.5-mile Milner-to-Kimberly reach, and 880,000 acre-feet for the 20.4-mile Kimberly-to-Buhl reach are reported for the same period.

The delineated source water assessment areas for the four wells of the City of Jerome can best be described as pie-slice shaped corridors extending approximately 45 miles to the northeast from the wellheads (Figure 2, Figure 3, and Figure 4 in Attachment A). The actual data used by WGI in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and the City of Jerome and from available databases.

The dominant land use outside the City of Jerome is predominantly rangeland to the east and irrigated agriculture to the north and south. Land use within the immediate area of the wellhead consists of residential property, except the area around the Peters well which is surrounded by agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted in June and July of 2001. This involved identifying and documenting potential contaminant sources within the City of Jerome Source Water Assessment Areas through the use of computer databases and Geographic Information System maps developed by DEQ.

The delineations of the 10th Street Wells (#1 and #2) have 12 potential point sources (See Figure 2, Table 1, Attachment A). The delineation of the A Street Well has 13 potential point sources (See Figure 3, Table 2, Attachment A). The Peter's Street Well delineation has 12 potential point sources (See Figure 4, Table 3, Attachment A). These potential contaminant sources include some deep injection wells, a few dairies, a gravel pit, an underground storage tank (UST), a site regulated under the Resource Conservation and Recovery Act (RCRA), a landfill regulated under the Comprehensive Environmental Response and Liability Act (CERCLA), and an inactive municipal landfill. The GIS map shows that all of the delineations cross Highway 25 and Highway 93 in the 3-year time of travel (TOT) zones. These are major transportation corridors that can contaminate the aquifer in the event of an accidental spill or release.

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment B contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was moderate for all four wells (see Table 5). This rating reflects the poor to moderately drained nature of the soil of the region, which decreases the downward movement of contaminants. However, the well logs of the Peter's Street Well and the 10th Street Well #1 indicate that the vadose zone is composed predominantly of fractured lava and gravel layers. First ground water was found at 277 feet below ground surface (bgs) for the 10th Street Well #1 and between 342 feet and 393 feet bgs for Peter's Street Well. The well logs for the other wells were unavailable, preventing a determination of the composition of the vadose zone, the depth to first ground water, or the presence of low permeable geologic units above the producing zone.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The drinking water wells of the City of Jerome all have a moderate system construction score. The 2000 sanitary survey indicates that all of the wells are protected from surface flooding and that the wellhead and surface seals are maintained to standards. The following paragraphs describe the system construction information obtained from available well logs, the Public Water System Questionnaire, and the 2000 sanitary survey. Table 4 below also summarizes the well construction information of each well.

Completed in 1957 to a depth of 397 feet bgs, the 10th Street Well #1 has an 18-inch diameter casing with .375-inch thickness set to a depth of 14 feet bgs into “gray lava, soft, solid.” The annular seal was installed to the same depth of 14 feet bgs and the static water level is found at 274 feet bgs. The highest producing zone of the well appears to be just below the static water level at 277 feet bgs. The well is not screened.

The 10th Street Well #2 was constructed in 1957. Though the well log was unavailable for this well, the Public Water Questionnaire and the 2000 sanitary survey provided some well construction information. The well is 376 feet deep and has an 18-inch diameter casing. The static water level is found at 291 feet bgs.

The A Street Well was constructed in 1921 and deepened in 1951. The total current depth is 378 feet bgs. The well log was unavailable for this well also but the Public Water Questionnaire and the 2000 sanitary survey provided some useful construction information. It has a 12-inch diameter casing and the well is screened from 340 feet to 341 feet bgs. The static water level is found at 305 feet bgs.

The Peter’s Street Well, constructed in 1983 to a depth of 709 feet bgs, has a 16-inch diameter casing with a 0.375-inch thickness set to a depth of 450 feet bgs into “solid lava.” The annular seal was installed to a depth of 26 feet bgs into “gray lava.” The static water level is found at 329 feet bgs and the highest producing zone appears to be between 342 feet and 709 feet bgs. The well is not screened.

Though the wells of the City of Jerome may have met standards at the time of construction, current well construction standards are stricter. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of at least 0.322-inches. Twelve-inch to 20-inch diameter wells require a casing thickness of at least .375 inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate.

Table 4. City of Jerome Well Construction Summary Information

Well	Well Depth (ft)	Water Table Depth (ft)	Casing: diameter/ thickness (in)	Casing: depth (ft)/ formation	Surface seal: depth (ft)/ formation	Screened Interval (ft)	Drill Year	Sanitary Survey Elements (A/B)[1]
10th Street Well #1	397	274	18/0.375	14/gray lava, soft, solid	14/gray lava, soft, solid	None	1957	Yes/Yes
10th Street Well #2	376	291	8/NI	NI	NI	NI	1957	Yes/Yes
A Street Well	378	330	12/NI	NI	NI	340-341	1921(deepened in 1951)	Yes/Yes
Peter’s Street Well	709	345	16/.375	450/solid lava	26/gray lava	None	1983	Yes/Yes

[1] A = Well and surface seal in compliance; B = Protected from surface flooding
NI = no information was available

Potential Contaminant Source and Land Use

All of the City of Jerome wells rate moderate for IOCs (i.e. arsenic, nitrate), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides) and low for microbial contaminants (i.e. bacteria). The number of potential contaminant sources within the 3-year TOT zones of the delineations contributed to the land use ratings for all of the wells.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will automatically lead to a high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, all of the wells of the City of Jerome have moderate susceptibility to all potential contaminant categories.

Table 5. Summary of the City of Jerome Susceptibility Evaluation

Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
10th Street Well #1	M	M	M	M	L	M	M	M	M	M
10th Street Well #2	M	M	M	M	L	M	M	M	M	M
A Street Well	M	M	M	M	L	M	M	M	M	M
Peter's Street Well	M	M	M	M	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, all of the wells of the City of Jerome have moderate susceptibility to all potential contaminant categories. The multiple potential contaminant sites in the 3-year TOT zones within the delineations of all of the wells as well as the moderate system construction and hydrologic sensitivity scores contributed to the overall susceptibility of the wells of the City of Jerome.

The VOCs Trihalomethanes, disinfection by-products created by reactions of a disinfectant with natural organic matter in the water, were detected in all of the wells between July 1998 and February 2000. Arsenic was detected in 1979 at 19 micrograms per liter (μg/L) and in 1997 at 5 μg/L. Though the arsenic detected in 1997 shows a decrease, it is still one-half of the newly revised MCL of 10 μg/L. In October 2001, the EPA reduced the arsenic maximum contaminant level (MCL) from 50 μg/L to 10 μg/L, giving public water systems until 2006 to comply with the new standard. Other IOCs including antimony, barium, chromium, fluoride, nitrate, iron, lead, magnesium, manganese, selenium, zinc, and nickel were detected in water samples collected from the water system at concentrations far below the MCLs. No SOCs have been detected in the wells. However, the county has been rated as high for nitrogen pesticide use, herbicide use, and total agricultural chemical use. Total coliform bacteria were detected in the distribution system in August 1994, August 1996, October 2000, and November 2001.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed source water protection program will incorporate many strategies, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For the City of Jerome, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey. Any spills from the potential contaminant sources listed in Tables 1, 2, and 3 (Attachment A) of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Engineering controls may need to be implemented if the arsenic levels in the drinking water system rise. Also, disinfection practices should be maintained if microbial contamination becomes a problem. The production of Trihalomethanes (disinfection by-products) can be reduced by treatment modifications. For control strategies and disinfection by-product information, see www.epa.gov/safewater/mdbp/dbpl.html. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the City of Jerome, making partnerships with state and local agencies and industry groups critical to success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near to urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are major transportation corridors that cross the delineations, the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, (mlharper@idahoruralwater.com) Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Attachment A

City of Jerome
Figures 2, 3, and 4
Tables 1, 2, and 3

Figure 2. City of Jerome Delineation Map and Potential Contaminant Source Locations

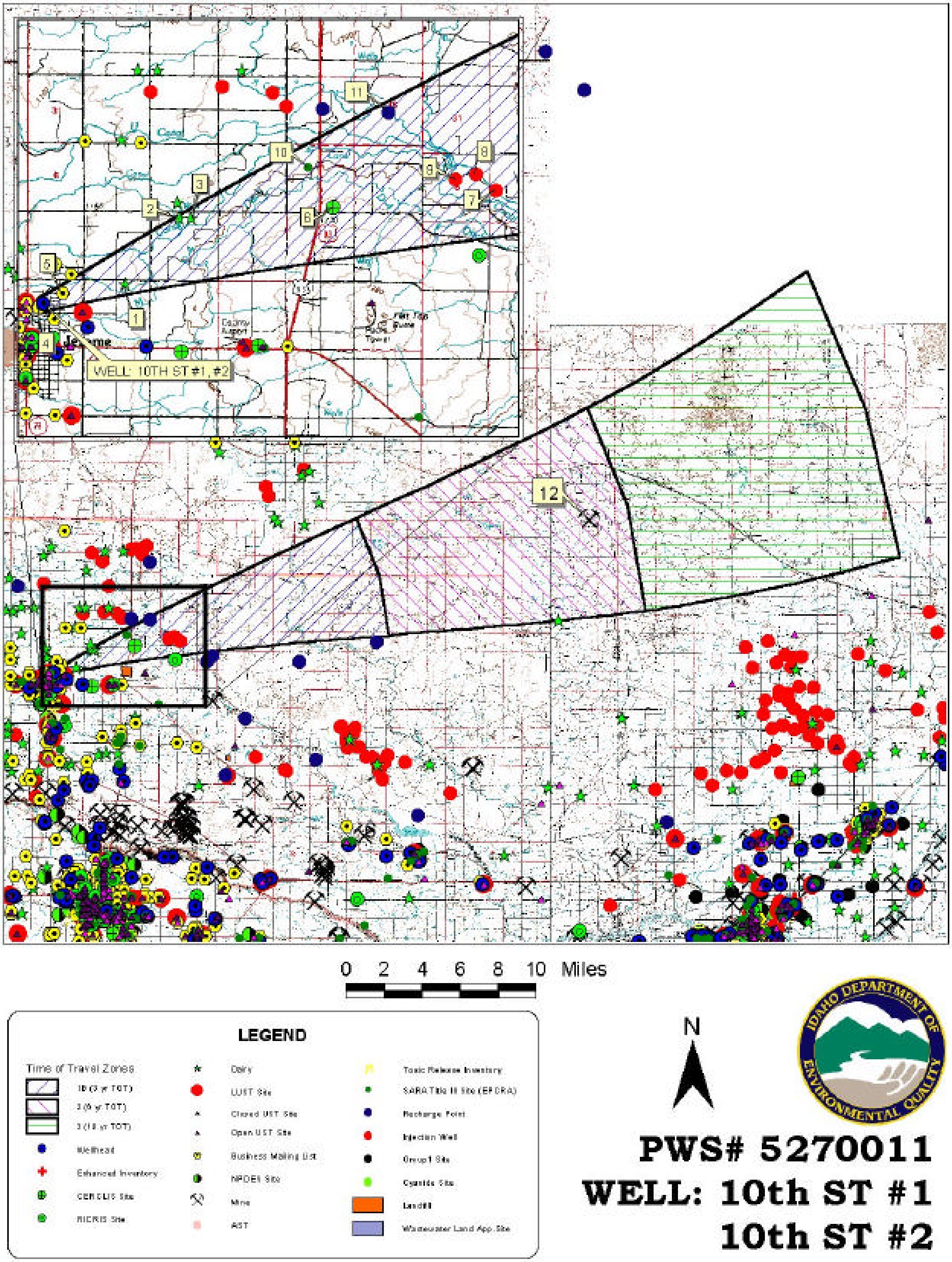


Figure 3. City of Jerome Delineation Map and Potential Contaminant Source Locations

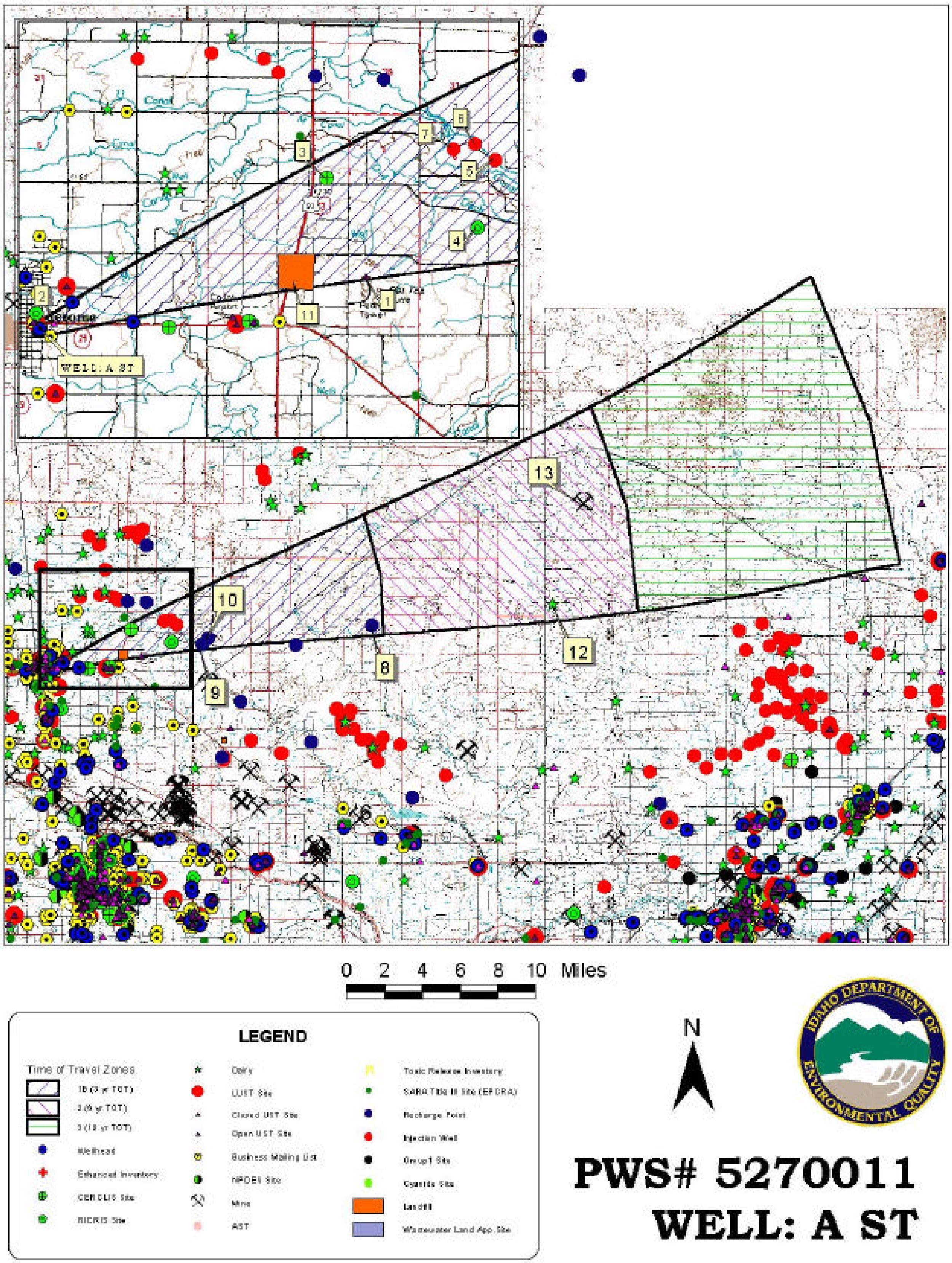
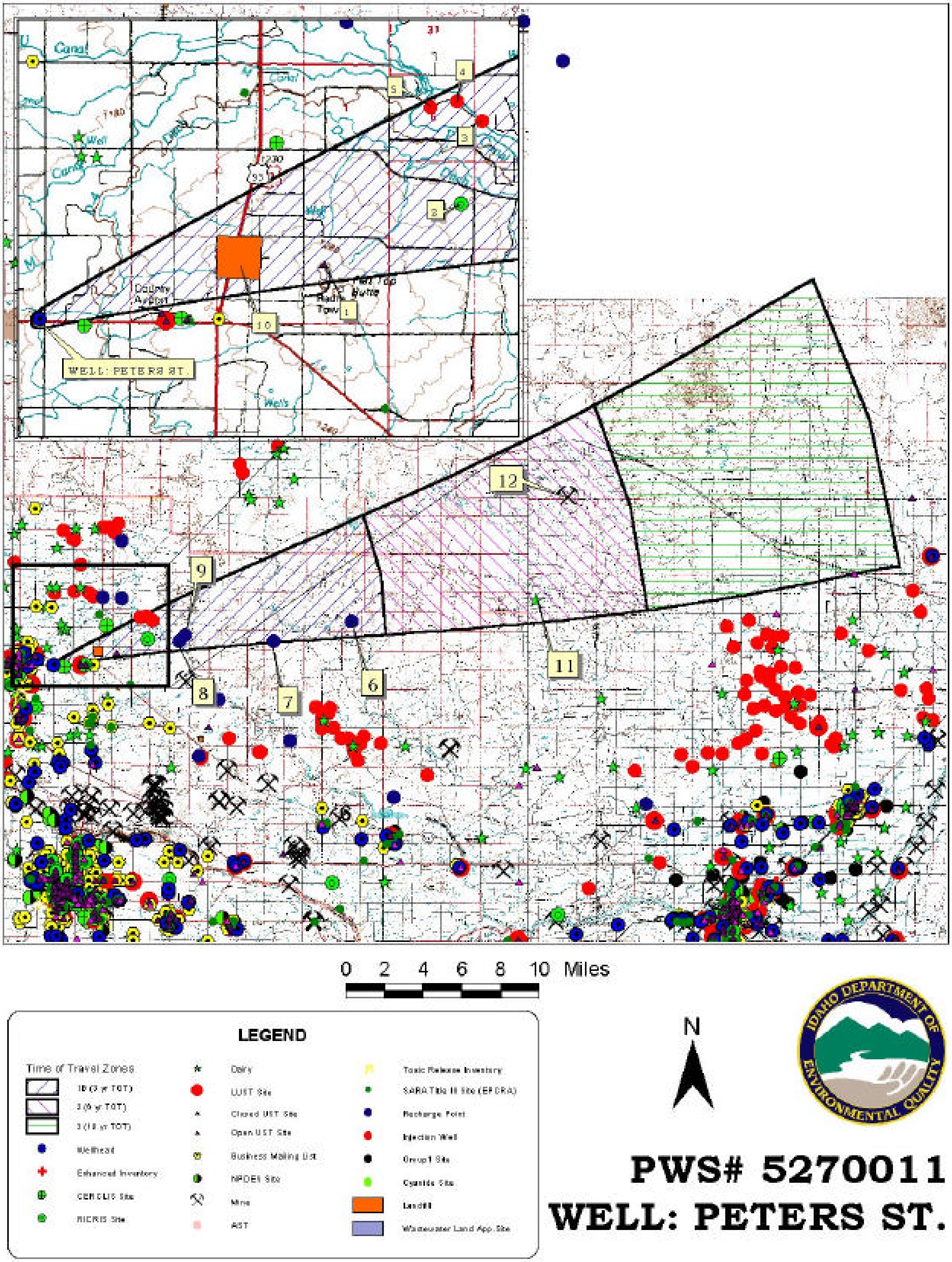


Figure 4. City of Jerome Delineation Map and Potential Contaminant Source Locations



PWS# 5270011

WELL: PETERS ST.

Table 1. 10th St. Wells #1 and #2. Potential Contaminant Inventory

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
1	Dairy<=200 Cows	0 – 3	Database Search	IOC, Microbials
2	Dairy<=200 Cows	0 – 3	Database Search	IOC, Microbials
3	Dairy=501-750 Cows	0 – 3	Database Search	IOC, Microbials
4	Building Maintenance	0 – 3	Database Search	IOC, VOC, SOC
5	Home Builders	0 – 3	Database Search	IOC, VOC, SOC
6	CERCLA Site	0 – 3	Database Search	IOC, VOC, SOC
7, 8, 9	Deep Injection Well-Active	0 – 3	Database Search	IOC, VOC, SOC
10	SARA-Telephone COM	0 – 3	Database Search	IOC
11	Recharge – Unused	0 – 3	Database Search	IOC, VOC, SOC
12	Mine	3 – 6	Database Search	IOC, VOC, SOC
	Highway 25	0 – 3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 93	0 – 3	GIS Map	IOC, VOC, SOC, Microbials

[1] **CERCLA = Comprehensive Environmental Response Compensation and Liability Act, SARA = Superfund Amendments and Reauthorization Act**
[2] **TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead**
[3] **IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical**

Table 2. A Street Well. Potential Contaminant Inventory.

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
1	UST-Closed	0 – 3	Database Search	VOC, SOC
2	UST-Open	0 – 3	Database Search	VOC, SOC
3	CERCLA Site	0 – 3	Database Search	IOC, VOC, SOC
4	RCRA Site	0 – 3	Database Search	IOC, VOC, SOC
5, 6, 7	Deep Injection Well-Active	0 – 3	Database Search	IOC, VOC, SOC
8	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
9, 10	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
11	Landfill-Municipal (Inactive)	0 – 3	Database Search	IOC, VOC, SOC, Microbials
12	Dairy<=200 Cows	3 – 6	Database Search	IOC
13	Mine	3 – 6	Database Search	IOC, VOC, SOC
	Highway 25	0 – 3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 93	0 – 3	GIS Map	IOC, VOC, SOC, Microbials

[1] **UST = underground storage tank, CERCLA = Comprehensive Environmental Response Compensation and Liability act, RCRA = Resource Conservation and Recovery Act**
[2] **TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead**
[3] **IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical**

Table 3. Peter's Street Well. Potential Contaminant Inventory.

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
1	UST-Closed	0 – 3	Database Search	VOC, SOC
2	RCRA Site	0 – 3	Database Search	IOC, VOC, SOC
3, 4, 5	Deep Injection Well	0 – 3	Database Search	IOC, VOC, SOC
6	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
7	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
8	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
9	Recharge-Unused	0 – 3	Database Search	IOC, VOC, SOC
10	Landfill-Municipal, Active	0 – 3	Database Search	IOC, VOC, SOC, Microbials
11	Dairy<=200 Cows	3 – 6	Database Search	IOC
13	Mine	3 – 6	Database Search	IOC, VOC, SOC
	Highway 25	0 – 3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 93	0 – 3	GIS Map	IOC, VOC, SOC, Microbials

[1] **UST = underground storage tank, RCRA = Resource Conservation and Recovery Act**
[2] **TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead**
[3] **IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical**

Attachment B

City of Jerome
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : JEROME CITY OF   Well# : 10TH ST #1

Public Water System Number 5270011   12/28/2001 1:34:07 PM

1. System Construction

		SCORE
Drill Date	5/17/1957	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	13	9	9	5
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	2	2	2	
4 Points Maximum		2	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		10	10	10	8
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		15	13	15	8

	IOC	VOC	SOC	Microbial
4. Final Susceptibility Source Score	11	11	11	11
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report   Public Water System Name : JEROME CITY OF   Well# : 10TH ST #2

Public Water System Number 5270011   12/28/2001 1:34:23 PM

1. System Construction		SCORE			
Drill Date	7/3/1957				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	2000			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	13	9	9	5
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	13	9	9	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	12	12	8
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		17	15	17	8
4. Final Susceptibility Source Score		11	11	11	11
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report — Public Water System Name : JEROME CITY OF — Well# : A ST WELL

Public Water System Number 5270011 — 12/28/2001 1:34:42 PM

1. System Construction		SCORE
Drill Date	1/1/1921	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	9	11	11	3
(Score = # Sources X 2) 8 Points Maximum		8	8	8	6
Sources of Class II or III leacheable contaminants or	YES	9	11	11	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	12	12	6
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		17	15	17	6
4. Final Susceptibility Source Score		11	11	11	10
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report   Public Water System Name : JEROME CITY OF   Well# : PETERS ST WELL

Public Water System Number 5270011   12/28/2001 1:34:58 PM

1. System Construction		SCORE			
Drill Date	11/30/1983				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2000			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		3			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	YES	0			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		3			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	9	9	9	2
(Score = # Sources X 2) 8 Points Maximum		8	8	8	4
Sources of Class II or III leacheable contaminants or	YES	11	9	9	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	12	12	4
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		17	15	17	4
4. Final Susceptibility Source Score		9	9	9	8
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate